

William C. Hammond

U.S. Geological Survey Earthquake Hazards Team
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Updated October 2, 2003

PROFESSIONAL EXPERIENCE

Postdoctoral Research Geophysicist
U.S. Geological Survey, Earthquake Hazards Team
Funded by: NASA Program for Solid Earth and Natural Hazards

Jan. 2001 - present

Project Manager, Fair, Isaac Company
Business Analytics and Consulting
Supervised team of analysts in building credit risk prediction models
San Rafael, California

1990 - Sept. 1994

EDUCATION

University of Oregon, Eugene
Department of Geological Sciences
Ph.D. Advisors: Eugene D. Humphreys and Douglas R. Toomey

Sept. 1994 - Oct. 2000

B.A. Applied Mathematics
University of California, Berkeley

1985-1989

HONORS AND AWARDS

April 2003	Young Scientist Travel Award, G.P.S. Vertical Workshop, Luxembourg
November 2002	Outstanding Achievement Award, U.S.G.S. Earthquake Hazards Team
May 1999	The Thayer Scholarship, Univ. of Oregon Dept. of Geological Sciences
June 1996	Paul and Helen Weiser Scholarship, Univ. of Oregon Dept. of Geological Sciences

FIELD EXPERIENCE

June 2001-Sept. 2003	Led four collaborative GPS surveys, each having as many as 90 sites, 17 observers, 24 instruments in long baseline networks spanning the Basin and Range, western U.S.
June 2001-June 2002	Led installation of seven long baseline campaign GPS networks, Basin and Range
1987-April 2000	Assisted with: <ul style="list-style-type: none">• Small scale seismic deployment, URS Corp., Portland OR., 1 week,• Outcrop scale active source seismic experiment, Oman Ophiolite, 1 month,• Multi-institution science party oceanic research cruise to East Pacific Rise 9°N, 1 month at sea, University of Oregon and University of Washington,• University of Oregon Deep Probe teleseismic network installation, 2 weeks,• Geotechnical field measurements, Harding Lawson Associates, 1 summer

TEACHING EXPERIENCE

Jan. 2002-present Initiated and led U.S.G.S. reading seminar: *Crustal Strain and Lithospheric Dynamics*
Winter 1999 Attended Colloquium on College Science Teaching, Univ. of Oregon, for credit
 course with readings, discussions and practical teaching experiences.
Winter 1995 Univ. of Oregon Teaching Fellow, section of *Earth Surface Processes and Morph.*
Spring 1995 Univ. of Oregon Teaching Fellow, section of *Intro. to Geology: The Evolving Earth*

INVITED PRESENTATIONS

February 4, 2004, *California State University, Hayward*, The Dynamics Behind Basin and Range Deformation from Measurement with the Global Positioning System.
August 13, 2003, *USGS*, The Effect of Upper Mantle Partial Melt on Seismic Wave Velocity.
February 26, 2002, *U.C. Berkeley Seismological Laboratory*, Seismic Velocity and Heterogeneity Beneath the MELT Region of the East Pacific Rise from Analysis of *P* and *S* Body waves.
May 3, 2001, *USGS Earthquake Hazards Seminar*, Dynamics, Flow, and Melt Content of the Southern East Pacific Rise Upper Mantle from Teleseismic Tomography.

PROFESSIONAL SERVICE

2003 Site Selection Working Group Member, Earthscope/Plate Boundary Observatory
1996-1997 Graduate Student Representative, Univ. of Oregon Dept. of Geological Sciences

RELEVANT ANALYTICAL, COMPUTATIONAL, AND TECHNICAL SKILLS

GPS data processing with GIPSY/OASIS II software package and associated C Shell and Perl scripts,
Numerical implementation of geophysical inverse theory,
Theory and numerical techniques in finite element modeling, softwares: ANSYS, PATRAN, GAEA,
Extensive Experience with Sun Solaris & Macintosh OS X UNIX,
Some UNIX system administration experience, some Linux,
Programming languages: Matlab, FORTRAN, C Shell, some HTML and Perl,
Seismic data processing and analysis, softwares: Datascope, Coral

PEER-REVIEWED PUBLICATIONS

Hammond, W.C. and W. Thatcher, Contemporary tectonic deformation of the Basin and Range province, western United States: 10 years of observation with the Global Positioning System, *J. Geophys. Res.* in review, 2003.

Hammond, W.C., Vertical motion of the Basin and Range, western United States from 10 Years of Campaign GPS, in *The State of GPS Vertical Positioning Precision: Separation of Earth Processes by Space Geodesy: Proceedings of the International Association of Geodesy*, European Center for Geodynamics and Seismology, Luxembourg, in review, 2003.

Hammond, W.C., and D.R. Toomey, Seismic velocity anisotropy and heterogeneity beneath the Mantle Electromagnetic and Tomography Experiment (MELT) region of the East Pacific Rise from analysis of *P* and *S* body waves, *J. Geophys. Res.*, 108(B4), 2176, doi:10.1029/2002JB001789, 2003.

Toomey, D.R., W.S.D. Wilcock, J.A. Conder, D.W. Forsyth, J.D. Blundy, E.M. Parmentier, W.C. Hammond, Asymmetric mantle dynamics in the MELT region of the East Pacific Rise, *Earth and Planet. Sci. Lett.*, 200, 287-295, 2002.

Hammond, W.C., and E.D. Humphreys, Upper mantle seismic wave velocity: The effect of realistic partial melt geometries, *J. Geophys. Res.*, 105, 10,975-10,986, 2000.

Hammond, W.C., and E.D. Humphreys, Upper mantle seismic wave attenuation: The effect of realistic partial melt distribution, *J. Geophys. Res.*, 105, 10,987-10,999, 2000.

Toomey, D.R., W.S.D. Wilcock, S.C. Solomon, W.C. Hammond, J.A. Orcutt, Mantle seismic structure beneath the MELT region of the East Pacific Rise from *P* and *S* wave tomography, *Science*, 280, 1224-1227, 1998.

CURRENT RESEARCH TOPICS LEADING TO PUBLICATION

Hammond, W.C., Nyst, M, Crustal deformation of the Walker Lane and central Great Basin from GPS measurement.

Hammond, W.C., and W. Thatcher, Crustal deformation of Northern California, Southern Oregon and Northern Nevada from measurement with the Global Positioning System.

PUBLISHED ABSTRACTS

Hammond, W.C., and W. Thatcher, Crustal Deformation of the Northern Basin and Range [Northern California, Oregon, Northern Nevada] from Measurement with the Global Positioning System *Eos Trans. AGU*, 84, Fall Meet. Suppl., 2003.

Thatcher, W., and W.C. Hammond, Present-day deformation of the Great Basin region, western U. S., and its implications for seismic hazard assessment, *Eos Trans. AGU*, 84, Fall Meet. Suppl., 2003.

Poland, M., D. Dzurisin, W. C. Hammond, E. Endo, E. Iwatsubo, M. Lisowski, New results from a proposed PBO Cascade volcano cluster I: Deformation in the Medicine Lake region of northeast California from leveling, GPS, and INSAR, *Geol. Soc. Am. Abstr. with Progr.*, vol 35, 2003.

Hammond, W.C., and W. Thatcher, Crustal deformation across the Basin and Range province [Nevada and Utah], western United States, measured with the Global Positioning System, 1992-2002, EGS-AGU-EUG Joint Assembly, Nice, France, *Geophys. Res. Abs.*, vol. 5, 2003.

Hammond, W.C., Pacific/North America plate boundary interaction seen in vertical deformation of the Basin and Range province, western United States., *The State of GPS Vertical Positioning Precision: Separation of Earth Processes by Space Geodesy*, workshop of the European Center for Geodynamics and Seismology, Luxembourg, April 2003.

Hammond, W.C., and W. Thatcher, GPS Measurement of deformation of the Basin and Range province, western United States, *Eos Trans. AGU*, 83, Fall Meet Suppl., 2002.

M. Nyst and W.C. Hammond, Present-day kinematics of crustal deformation of the Walker Lane and central Nevada, derived from GPS data, *Eos Trans. AGU*, 83, Fall Meet Suppl., 2002.

Hammond, W.C. and W. Thatcher, Integrated kinematic analysis of GPS and fault slip data in the Eastern California Shear Zone, Walker Lane and Sierra Nevada., *Eos Trans. AGU*, 82, Fall Meet Suppl., 2001.

Hammond, W.C., and W. Thatcher, The dynamics of western United States tectonism, Earthscope Workshop, *Making and Breaking a Continent*, Snowbird, UT, October, 2001.

Barclay, A.H., D.R. Toomey, W.S.D. Wilcock, W.C. Hammond, Geodynamic and seismic modeling of the MELT region of the East Pacific Rise: An example of plate scale hotspot-ridge interaction, *Eos Trans. AGU*, 82, Fall Meet Suppl., 2001.

Toomey, D.R., W.S.D. Wilcock, J. Blundy, W.C. Hammond, Asymmetric mantle dynamics in the MELT region of the East Pacific Rise: A result of hot, asthenospheric return flow, *Eos Trans. AGU*, 80, 1999.

Hammond, W.C., and D.R. Toomey, Seismic anisotropy beneath the MELT region of the East Pacific Rise from tomography and shear wave splitting, *Eos Trans. AGU*, 80, 1999.

Hammond, W.C., and E.D. Humphreys, The effects of partial melt on frequency dependent upper mantle seismic velocities: finite element modeling and pressure equalization via fluid flow, presented at meeting of the Incorporated Research Institutions for Seismology (IRIS), Santa Cruz, CA, July, 1998.

Hammond, W.C., and D.R. Toomey, Seismic structure and anisotropy beneath the MELT region of the East Pacific Rise, presented at meeting of the Incorporated Research Institutions for Seismology (IRIS), Santa Cruz, CA, July, 1998.

Hammond, W.C., and E.D. Humphreys, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves and permeability in the upper mantle, presented at RIDGE meeting, *Mantle Flow and Melt Generation Beneath Mid-Ocean Ridges: Constraints from MELT and Other Experiments*, Providence, RI, October 5-7, 1997.

Toomey, D.R., A.H. Barclay, R.A. Dunn, W.C. Hammond, Tomographic imaging in anisotropic media: results from studies of mid-ocean ridges, *Annales Geophysicae*, 1997.

Hammond, W.C., and E.D. Humphreys, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves and permeability in the upper mantle, presented at meeting of the Incorporated Research Institutions for Seismology (IRIS), Breckenridge, CO, June 8-12, 1997.

Toomey, D.R., S.C. Solomon, W.S.D. Wilcock, D.K. Blackman, J.A. Orcutt, W.C. Hammond, Upper mantle structure beneath the MELT Region of the East Pacific Rise from initial observations of *P* and *S* delay times, *Eos Trans. AGU*, 77, 1996.

Hammond, W.C., and E.D. Humphreys, Gravity and bathymetry of the Hawaiian hotspot predicted from 3D finite element modeling with surface and sub-surface loading, *Eos Trans. AGU*, 77, 1996.

Hammond, W.C., and E.D. Humphreys, Finite element modeling of the effect of partial melt on the velocity and attenuation of seismic waves, *Eos Trans. AGU*, 76, 1995.